OCD-ARTESIA

ATS-08-352
EA-08-811

Form 3160-3
(August 2007)

FORM APPROVED
OMB No 1004-0136
Expires July 31, 2010

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

JUL 21 2008
OCD-ARTESIA

EC

APPLICATION FOR PERMIT TO DRILL OR REENTER

5 Lease Serial No.
NMNM17224

6. If Indian, Allottee or Tribe Name

1a Type of Work ☒ DRILL ☐ REENTER CONFIDENTIAL

7 If Unit or CA Agreement, Name and No

8 Lease Name and Well No.
QUEEN LAKE 20 FEDERAL 2H

1b Type of Well. ☒ Oil Well ☐ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone

2 Name of Operator
CHESAPEAKE OPERATING, INC.
Contact. LINDA GOOD
E-Mail: linda good@chk com
147179

9. API Well No
30-015-36444
30178

3a Address
PO BOX 18496
OKLAHOMA CITY, OK 73154-0496

3b. Phone No (include area code)
Ph: 405-767-4275
Fx 405-879-7899

10. Field and Pool, or Exploratory
PIERCE CROSSING
BS
50371

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*

At surface SWSE 350FSL 1650FEL

At proposed prod. zone SWSW 350FSL 350FWL

11 Sec., T., R., M., or Blk and Survey or Area
Sec 20 T24S R29E Mer NMP
SME: BLM

14. Distance in miles and direction from nearest town or post office*
APPROXIMATELY 4 MILES SE OF MALAGA, NM.

12 County or Parish
EDDY

13 State
NM

15 Distance from proposed location to nearest property or lease line, ft. (Also to nearest drig unit line, if any)

16. No of Acres in Lease
959.10

17 Spacing Unit dedicated to this well
120.00

18 Distance from proposed location to nearest well, drilling, completed, applied for, on this lease, ft

19 Proposed Depth
10938 MD

20. BLM/BIA Bond No. on file
NM2634

21 Elevations (Show whether DF, KB, RT, GL, etc
2950 GL

22 Approximate date work will start

23 Estimated duration

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No 1, shall be attached to this form:

1. Well plat certified by a registered surveyor
2. A Drilling Plan
3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO shall be filed with the appropriate Forest Service Office)
4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
5. Operator certification
6. Such other site specific information and/or plans as may be required by the authorized officer.

25 Signature
(Electronic Submission)

Name (Printed/Typed)
LINDA GOOD Ph: 405-767-4275

Date
02/14/2008

Title
REGULATORY COMPLIANCE SPECIALI

Approved by (Signature)
/s/ Don Peterson

Name (Printed/Typed)

Date
JUL 16 2008

Title
FIELD MANAGER

Office
CARLSBAD FIELD OFFICE

Application approval does not warrant or certify the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.
Conditions of approval, if any, are attached

APPROVAL FOR TWO YEARS

Title 18 U S C Section 1001 and Title 43 U S C Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction

Additional Operator Remarks (see next page)

Carlsbad Controlled Water Basin

Electronic Submission #58619 verified by the BLM Well Information System
For CHESAPEAKE OPERATING, INC., sent to the Carlsbad
Committed to AFMSS for processing by TESSA CISNEROS on 02/14/2008 (08TLC0161AE)

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

Approval Subject to General Requirements & Special Stipulations Attached

**** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ****

KMD
FA

Additional Operator Remarks:

CHESAPEAKE OPERATING, INC. RESPECTFULLY REQUESTS PERMISSION TO DRILL A WELL TO 10,938' TO TEST THE DELAWARE FORMATION. IF PRODUCTIVE, CASING WILL BE RUN AND THE WELL COMPLETED. IF DRY, THE WELL WILL BE PLUGGED AND AVANDONED AS PER BLM AND NEW MEXICO OIL CONSERVATION DIVISION REQUIREMENTS.

PLEASE FIND THE SURFACE USE PLAN AND DRILLING PLAN AS REQUIRED BY ONSHORE ORDER NO. 1.

CHESAPEAKE OPERATING, INC. HAS AN AGREEMENT WITH THE GRAZING LESSEE.

PLEASE BE ADVISED THAT CHESAPEAKE OPERATING, INC. IS CONSIDERED TO BE THE OPERATOR OF THE ABOVE MENTIONED WELL. CHESAPEAKE OPERATING, INC. AGREES TO BE RESPONSIBLE UNDER THE TERMS AND CONDITIONS OF THE LEASE FOR THE OPERATIONS CONDUCTED UPON THE LEASE LANDS.

(CHK PN 618435)

State of New Mexico
Energy, Minerals and Natural Resources Department

DISTRICT I
1625 N. FRENCH DR., HOBBS NM 88240

DISTRICT II
1301 W. GRAND AVENUE, ARTESIA, NM 88210

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

DISTRICT IV
1220 S ST. FRANCIS DR., SANTA FE, NM 87505

OIL CONSERVATION DIVISION
1220 SOUTH ST. FRANCIS DR.
Santa Fe, New Mexico 87505

Form C-102
Revised October 12, 2005
Submit to Appropriate District Office
State Lease – 4 Copies
Fee Lease – 3 Copies

WELL LOCATION AND ACREAGE DEDICATION PLAT

☐ AMENDED REPORT

API Number	Pool Code	Pool Name
	50371	Pierce Crossing; Bone Spring, Oil

Property Code	Property Name	Well Number
301172	QUEEN LAKE 20 FEDERAL	2H

OGRID No.	Operator Name	Elevation
147179	CHESAPEAKE OPERATING, INC.	2859'

Surface Location

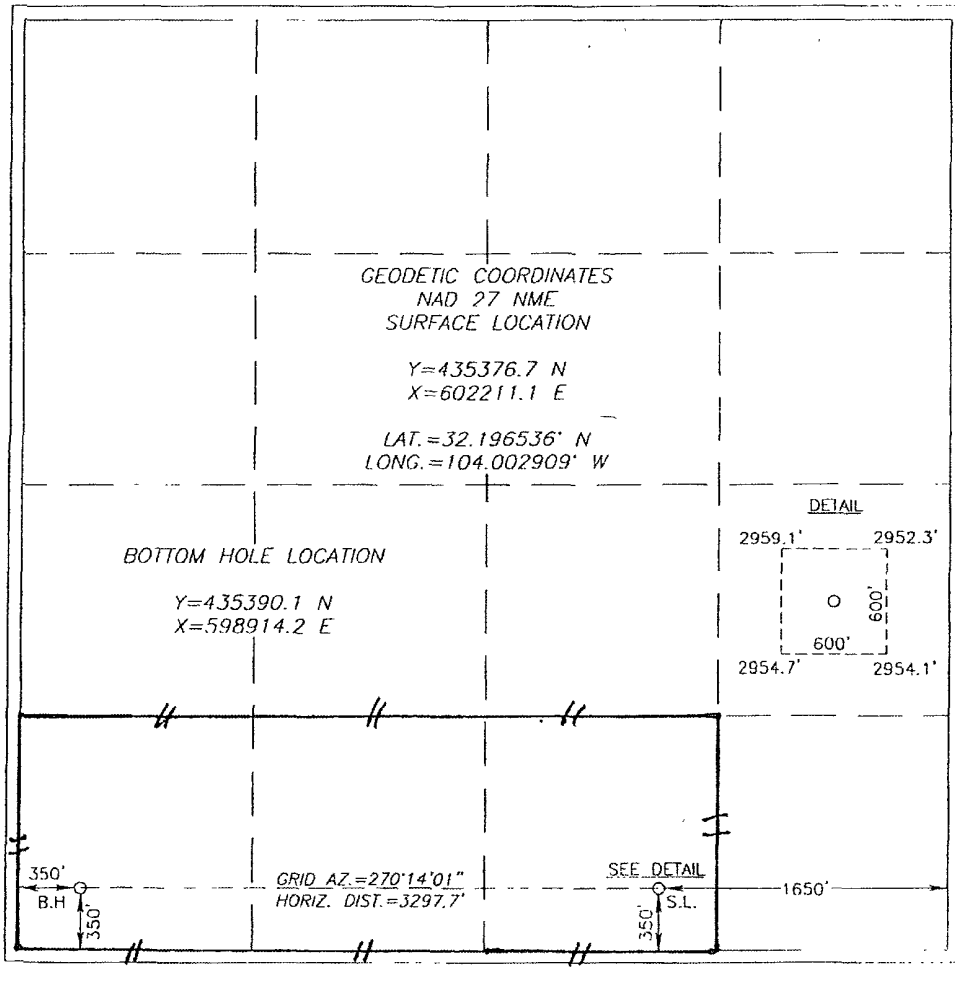
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
O	20	24-S	29-E		350	SOUTH	1650	EAST	EDDY

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	20	24-S	29-E		350	SOUTH	350	WEST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
120			

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



OPERATOR CERTIFICATION

I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Craig Barnard 2/6/08
Signature Date

CRAIG BARNARD
Printed Name

SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

DECEMBER 6, 2007
Date Surveyed | REV. 2/05/08 AR
Signature & Seal of Professional Surveyor

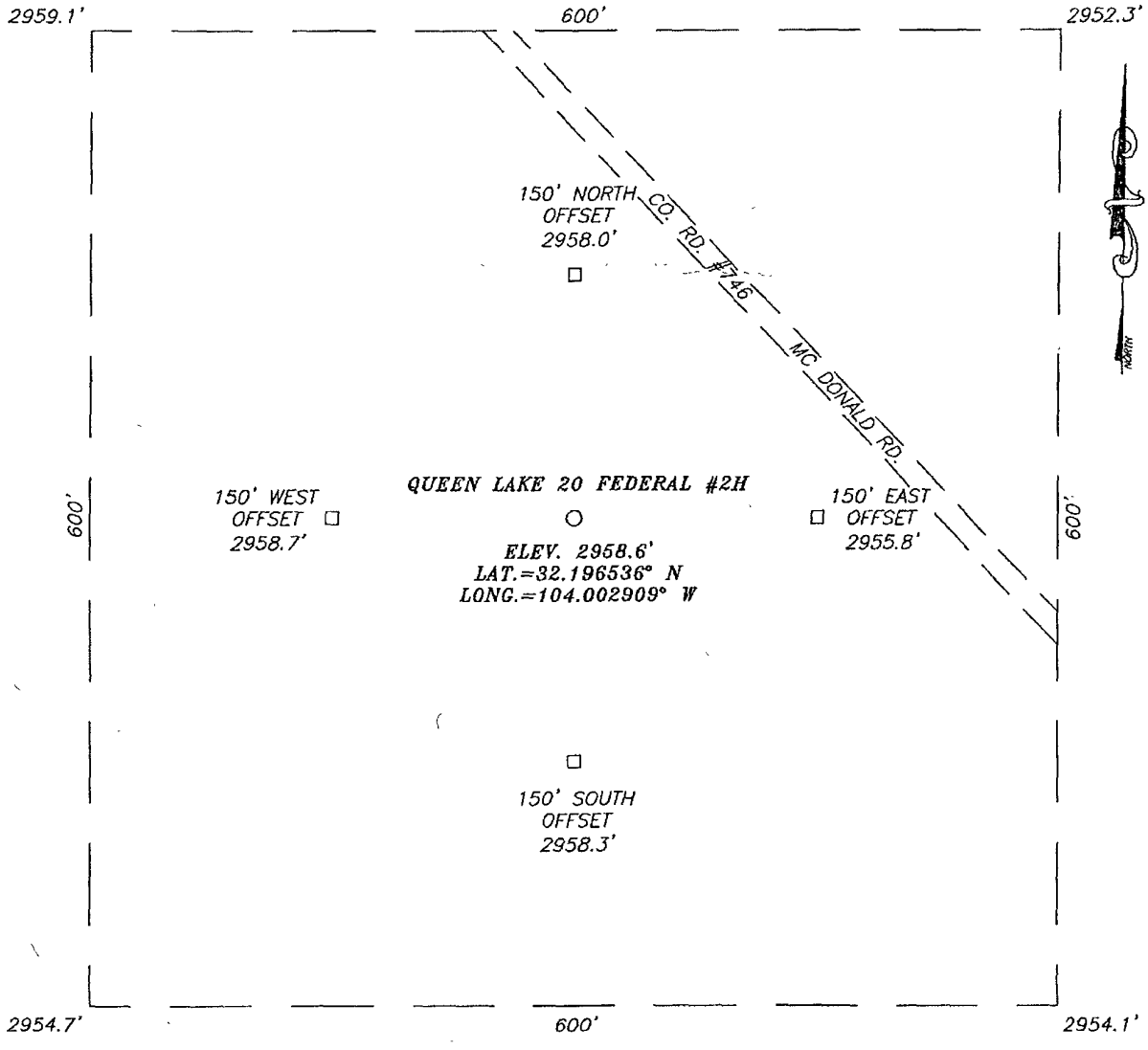
Ronald J. Eidson 02/05/08
07.11.1643

Certificate No. GARY EIDSON 12641
RONALD J. EIDSON 3239

EXHIBIT A-1

SECTION 20, TOWNSHIP 24 SOUTH, RANGE 29 EAST, N.M.P.M.,

EDDY COUNTY, NEW MEXICO



DIRECTIONS TO LOCATION

FROM THE INTERSECTION OF CO. RD. #746 (MC DONALD RD.) AND CO. RD. #788A (SPUR RD.), GO SOUTHEAST ON CO. RD. #746 APPROX. 0.5 MILES. THIS LOCAITON IS APPROX. 150 FEET SOUTH.

100 0 100 200 Feet

Scale:1"=100'

PROVIDING SURVEYING SERVICES SINCE 1946

JOHN WEST SURVEYING COMPANY

412 N. DAL PASO

HOBBS, N.M. 88240

(505) 393-3117

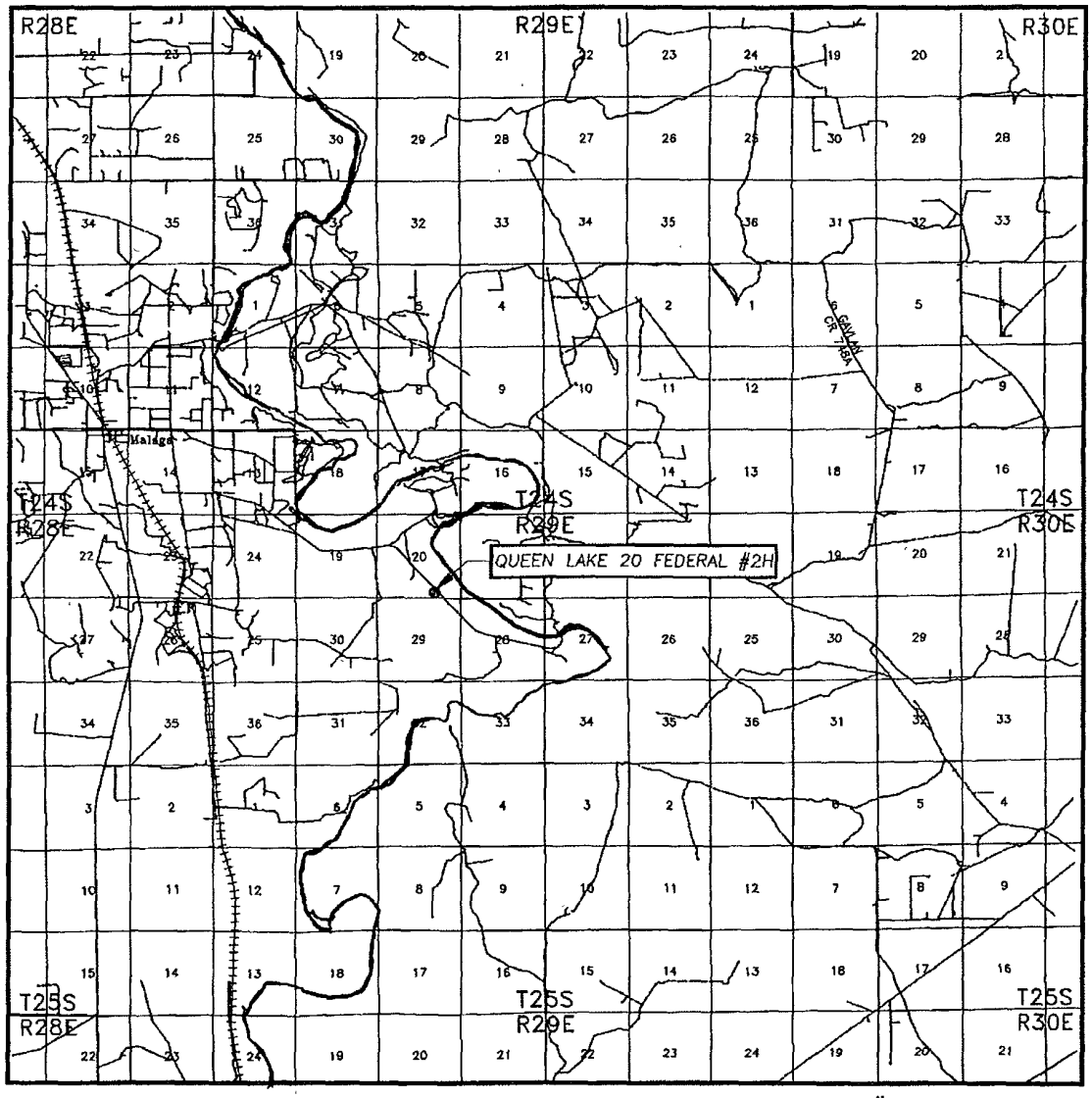
CHESAPEAKE OPERATING, INC.

QUEEN LAKE 20 FEDERAL #2H
LOCATED 350 FEET FROM THE SOUTH LINE
AND 1650 FEET FROM THE EAST LINE OF SECTION 20,
TOWNSHIP 24 SOUTH, RANGE 29 EAST, N.M.P.M.,
EDDY COUNTY, NEW MEXICO.

Survey Date: 12/6/70	Sheet 1 of 1 Sheets		
W.O. Number: 07.11.1643	Dr By: AR		Rev 1:N/A
Date: 1/28/08	Disk:	07111643	Scale:1"=100'

EXHIBIT A-2

VICINITY MAP



SCALE: 1" = 2 MILES

SEC. 20 TWP. 24-S RGE. 29-E

SURVEY N.M.P.M.

COUNTY EDDY STATE NEW MEXICO

DESCRIPTION 350' FSL & 1650' FEL

ELEVATION 2959'

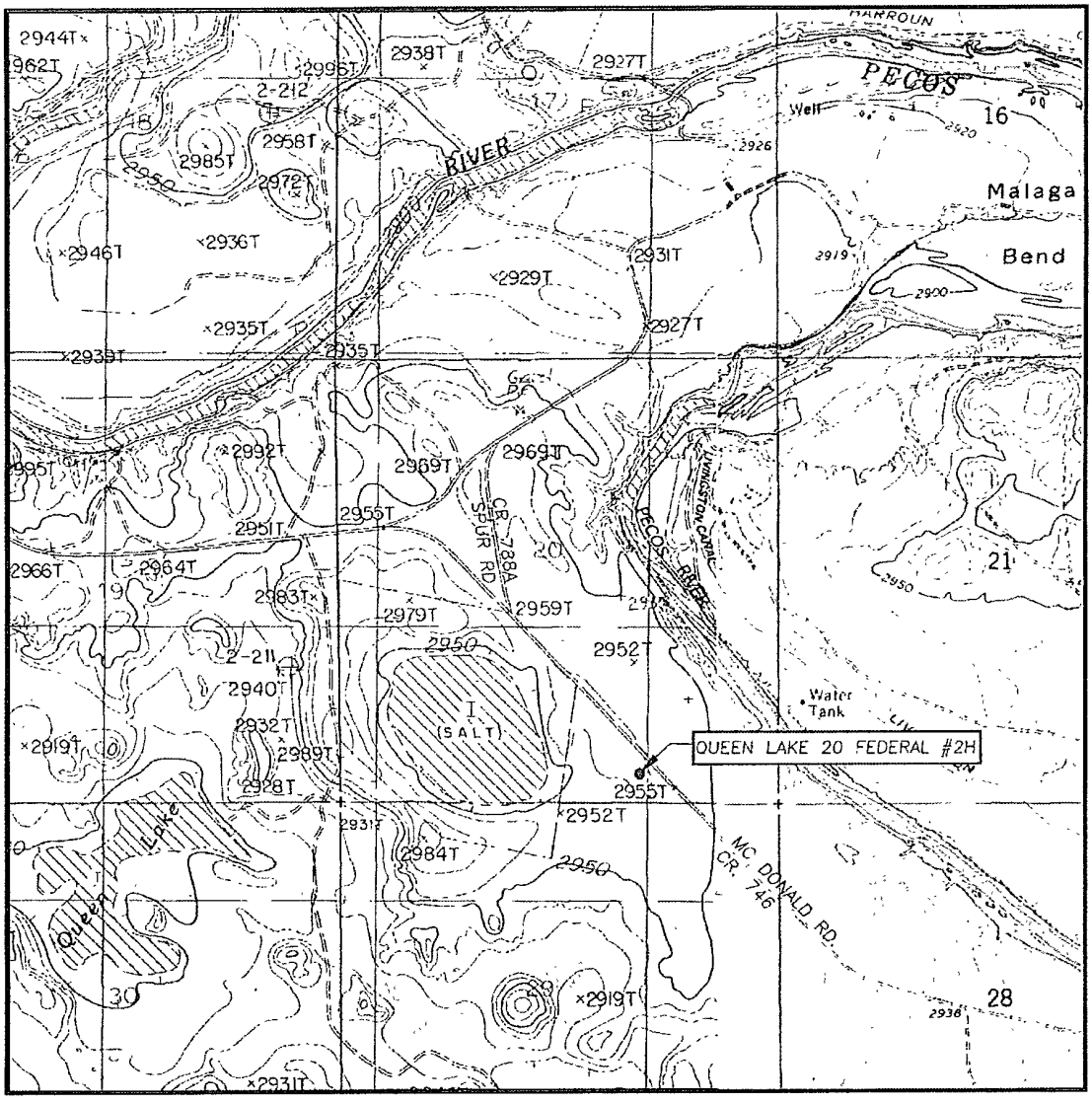
OPERATOR CHESAPEAKE OPERATING, INC.

LEASE QUEEN LAKE 20 FEDERAL

PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO
HOBBS, N.M. 88240
(505) 393-3117

EXHIBIT A-3

LOCATION VERIFICATION MAP



SCALE: 1" = 2000'

CONTOUR INTERVAL:
MALAGA, N.M. – 10'
SUPPLEMENTAL–5'
PIERCE CANYON, N.M. – 10'

SEC. 20 TWP. 24–S RGE. 29–E

SURVEY N.M.P.M.

COUNTY EDDY STATE NEW MEXICO

DESCRIPTION 350' FSL & 1650' FEL

ELEVATION 2959'

OPERATOR CHESAPEAKE OPERATING, INC

LEASE QUEEN LAKE 20 FEDERAL

U.S.G.S. TOPOGRAPHIC MAP
MALAGA, N.M.

PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO
HOBBS, N.M. 88240
(505) 393-3117

EXHIBIT A-4

ONSHORE OIL & GAS ORDER NO. 1
Approval of Operations on Onshore
Federal and Indian Oil and Gas Leases

All lease and/or unit operations are to be conducted in such a manner that full compliance is made with the applicable laws, regulations (CFR 43, Part 3160) and the approved Application for Permit to Drill. The operator is considered fully responsible for the actions of his subcontractors. A copy of the approved APD must be on location during construction, drilling and completion operations.

Approval of this application does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease, which would entitle the applicant to conduct operations thereon.

1. FORMATION TOPS

The estimated tops of important geologic markers are as follows:

Formation	SUBSEA KBTVD	KBTVD
BASE OF SALT	167'	2,801'
*BELL CANYON	114'	2,854'
MANZANITA MARKER	-891'	3,859'
KOP		
BRUSHY CANYON	-2,378'	5,346'
BONE SPRING LIME	-3,581'	6,549'
1ST BONE SRING CARBONATE	-4,130'	7,098'
1ST BONE SPRING SAND	-4,525'	7,493'
**1ST Bone Spring Sd. Target Top	**-4,539'**	**7,507'**
**1ST Bone Spring Sd. Target Base	**-4,550'**	**7,518'**
1st BONE SPRING UPR SD BASE	-4,630'	7,598'
**Potentially productive zones		
	TD (TVD)	**7,500'**

2. ESTIMATED DEPTH OF WATER, OIL, GAS & OTHER MINERAL BEARING FORMATIONS

The estimated depths at which the top and bottom of the anticipated water, oil, gas or other mineral bearing formations are expected to be encountered are as follows:

Substance	Formation	Depth
Oil/Gas	Bell Canyon	2745-3499
Oil/Gas	Cherry Canyon	3499-5242
Oil/Gas	Brushy Canyon	5242-6483
"	Bone Spring	7507 - 7518 - per operator 3-13-08 WWI

Do not match tops

All shows of fresh water and minerals will be reported and protected.

3. BOP EQUIPMENT:

See COA

Will have a 3000 psi simplified rental stack (see proposed schematic) for drill out below surface casing; this system will be tested to 2000 psi working pressure.

Will have a 5000 psi rig stack (see proposed schematic) for drill out below intermediate casing; this system will be tested to 3000 psi working pressure.

Chesapeake Operating, Inc.'s minimum specifications for pressure control equipment are as follows:

I. BOP, Annular, Choke Manifold, Pressure Test (Schematic) - See Exhibit F.

A. Equipment
1. The equipment to be tested includes all of the following that is installed on the well:
(a) Ram-type and annular preventers,
(b) Choke manifolds and valves,
(c) Kill lines and valves, and
(d) Upper and lower kelly cock valves, inside BOP's and safety valves.

B. Test Frequency
1. All tests should be performed with clear **water**,
(a) when installed,
(b) before drilling out each casing string,
(c) at any time that there is a repair requiring a pressure seal to be broken in the assembly, and
(d) at least once every **30 days** while drilling.

C. Test Pressure
1. In some drilling operations, the pressures to be used for low and high-pressure testing of preventers and casing may be different from those given below due to governmental regulations, or approved local practices.
2. If an individual component does not test at the low pressure, **do not,** test to the high pressure and then drop back down to the low pressure.

3. All valves located downstream of a valve being tested must be placed in the open position.
4. All equipment will be tested with an initial "low pressure" test at 250 psi.
5. The subsequent "high pressure" test will be conducted at the rated working pressure of the equipment for all equipment except the annular preventer.
6. The "high pressure" test for the annular preventer will be conducted at 70% of
7. the rated working pressure.
8. A record of all pressures will be made on a pressure-recording chart.

D. Test Duration

1. In each case, the individual components should be monitored for leaks for **5 minutes,** with no observable pressure decline, once the test pressure as been applied.

II. Accumulator Performance Test

A. Scope

1. The purpose of this test is to check the capabilities of the BOP control systems, and to detect deficiencies in the hydraulic oil volume and recharge time.

B. Test Frequency

1. The accumulator is to be tested each time the BOP's are tested, or any time a major repair is performed.

C. Minimum Requirements

1. The accumulator should be of sufficient volume to supply 1.5 times the volume to close and hold all BOP equipment in sequence, **without recharging** and the **pump turned off**, and have remaining pressures of **200 PSI above the precharge pressure**.

2. Minimum precharge pressures for the various accumulator systems per **manufacturers recommended specifications** are as follows:

3.

System Operating Pressures	Precharge Pressure
1500 PSI	750 PSI
2000 PSI	1,000 PSI
3000 PSI	1,000 PSI

3. Closing times for the Hydril should be less than **20 seconds**, and for the ram-type preventers less than **10 seconds**.

4. System Recharge time should not exceed **10 minutes**.

D. Test Procedure

1. Shut accumulator pumps off and record accumulator pressure.

2. In sequence, close the annular and one set of properly sized pipe rams, and open the HCR valve.
3. Record time to close or open each element and the remaining accumulator pressure after each operation.

4. Record the remaining accumulator pressure at the end of the test sequence. Per the previous requirement, this pressure **should not be less** than the following pressures:

System Pressure	Remaining Pressure At Conclusion of Test
1,500 PSI	950 PSI
2,000 PSI	1,200 PSI
3,000 PSI	1,200 PSI

5. Turn the accumulator pumps on and record the recharge time. This time should not exceed **10 minutes.**

6. Open annular and ram-type preventers. Close HCR valve.

7. Place all 4-way control valves in **full open** or **full closed** position. **Do not leave in neutral position**.

4. CASING AND CEMENTING PROGRAM

a. The proposed casing program will be as follows:

Purpose	Interval	Hole Size	Casing Size	Weight	Grade	Thread	Condition
Surface	Surface – 650'	17-1/2"	13-3/8"	48.0#	H-40	STC	New
Intermediate	Surface – 2,900'	12-1/4"	9-5/8"	40.0#	J-55	LTC	New
Production	Surface – 10,938'	8-3/4"/ 8-1/2"	5-1/2"	17.0#	P-110	LTC	New

8¾" to 7779 MD

b. Casing design subject to revision based on geologic conditions encountered.

c. Casing Safety Factors:
13-3/8" Surface Casing: SFb = 1.44, SFc = 2.87 and SFt = 2.11
9-5/8" Intermediate Casing: SFb = 1.77, SFc = 1.49 and SFt = 5.0
5-1/2" Production Casing: SFb = 1.8, SFc = 2.43 and SFt = 1.54

d. The cementing program will be as follows:

5. Cementing Program

Interval	Type	Amount	Yield	Top Of Cement	Excess
Surface	Lead: 35:65 Poz/C 1% CaCl2 (Accelerator) Tail: Class C 2% CaCl2 (Accelerator)	290 sks 220 sks	2.10 1.34	Surface	100%
Intermediate	Lead: 35/65 Poz/Class C 1% CaCl2 (Accelerator) Tail: Class C 2% CaCl2	600 sks 210 sks	2.10 1.34	Surface	75% 50%
Production	Class H 0.5% LAP-1 (Fluid Loss Control) 0.4% CFR-3 (Dispersant) 1 lbm/sk Salt 0.3% HR-7 (Retarder) 0.25 lbm D-AIR 3000 (Defoamer)	1500 sks	1.60	2,400'	40%

6. MUD PROGRAM

a. The proposed circulating mediums to be used in drilling are as follows:

Interval	Mud Type	Mud Weight	Viscosity	Fluid Loss
0' – 650'	FW/Gel	8.4 – 9.0	28-32	NC
650' – 2,900'	Native/Brine	9.9 – 10.1	30-32	NC
2,900' - TD	FW/LSND	8.8 – 9.3	28-36	20-5

A closed system will be utilized consisting of above ground steel tanks. All wastes accumulated during drilling operations will be contained in a portable trash cage and removed from location and deposited in an approved sanitary landfill.

A mud test shall be performed every 24 hours after mudding up to determine, as applicable: density, viscosity, gel strength, filtration, and pH.

6. TESTING, LOGGING AND CORING

The anticipated type and amount of testing, logging and coring are as follows:

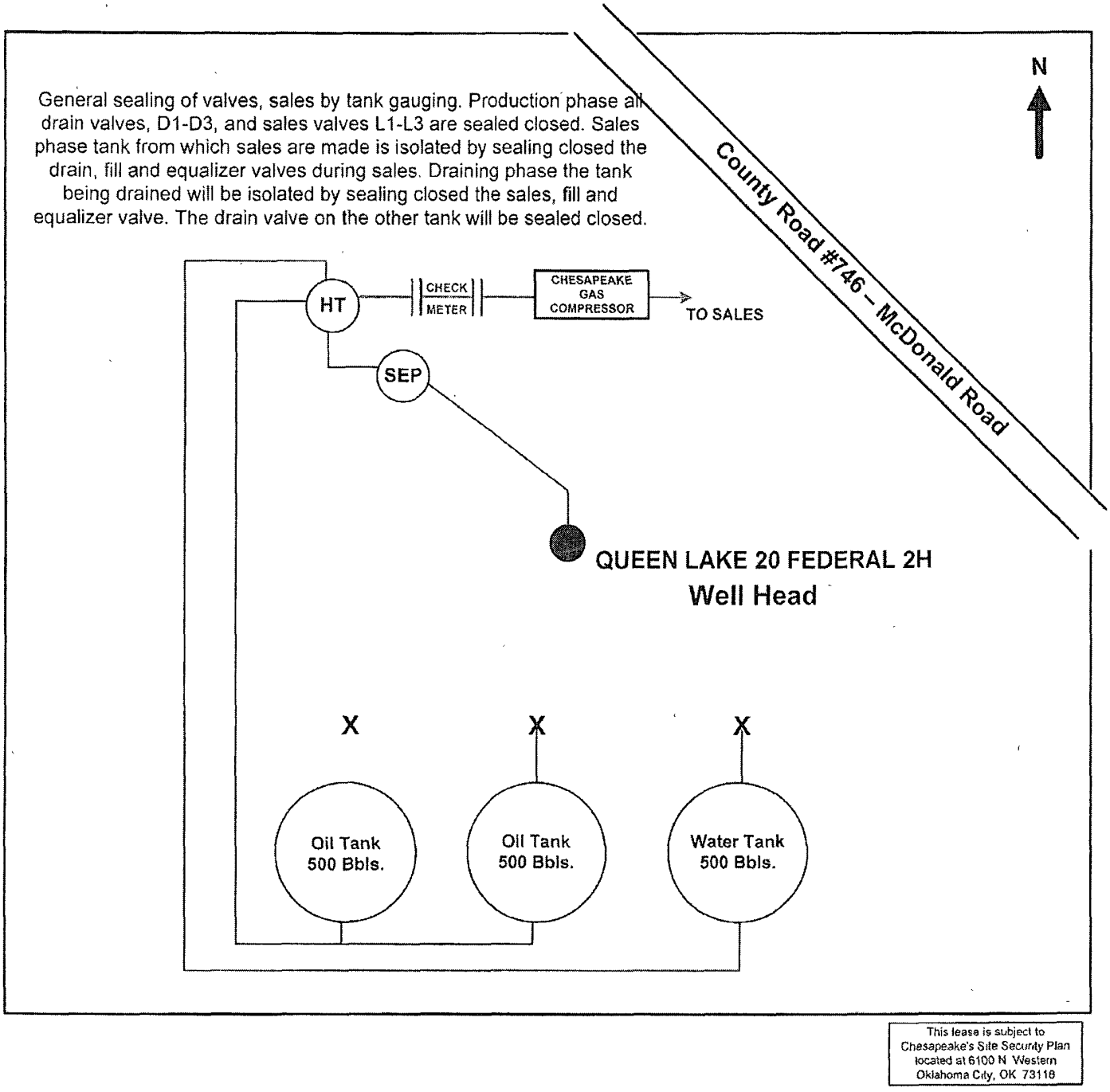
a. Drill stem tests are not planned.
b. The logging program will consist of Natural GR, Density-Neutron, PE & Dual Laterolog from TD to surface casing; Neutron-GR surface casing to surface.
c. Cores samples are not planned.

7. ABNORMAL PRESSURES AND HYDROGEN SULFIDE

a. The estimated bottom hole pressure is 3200 psi. No abnormal pressures or temperatures are anticipated.
b. Hydrogen sulfide gas is not anticipated

CHESAPEAKE OPERATING, INC.

QUEEN LAKE 20 FEDERAL #2H
350' FSL &1650' FEL – SECTION 20 -T24S – R29E
EDDY COUNTY, NM – APPROXIMATELY 4 MILES SE OF MALAGA, NM



Prepared by: JACKIE REYNOLDS
Date: 2-11-2008

Approved by:
Date:

EXHIBIT C

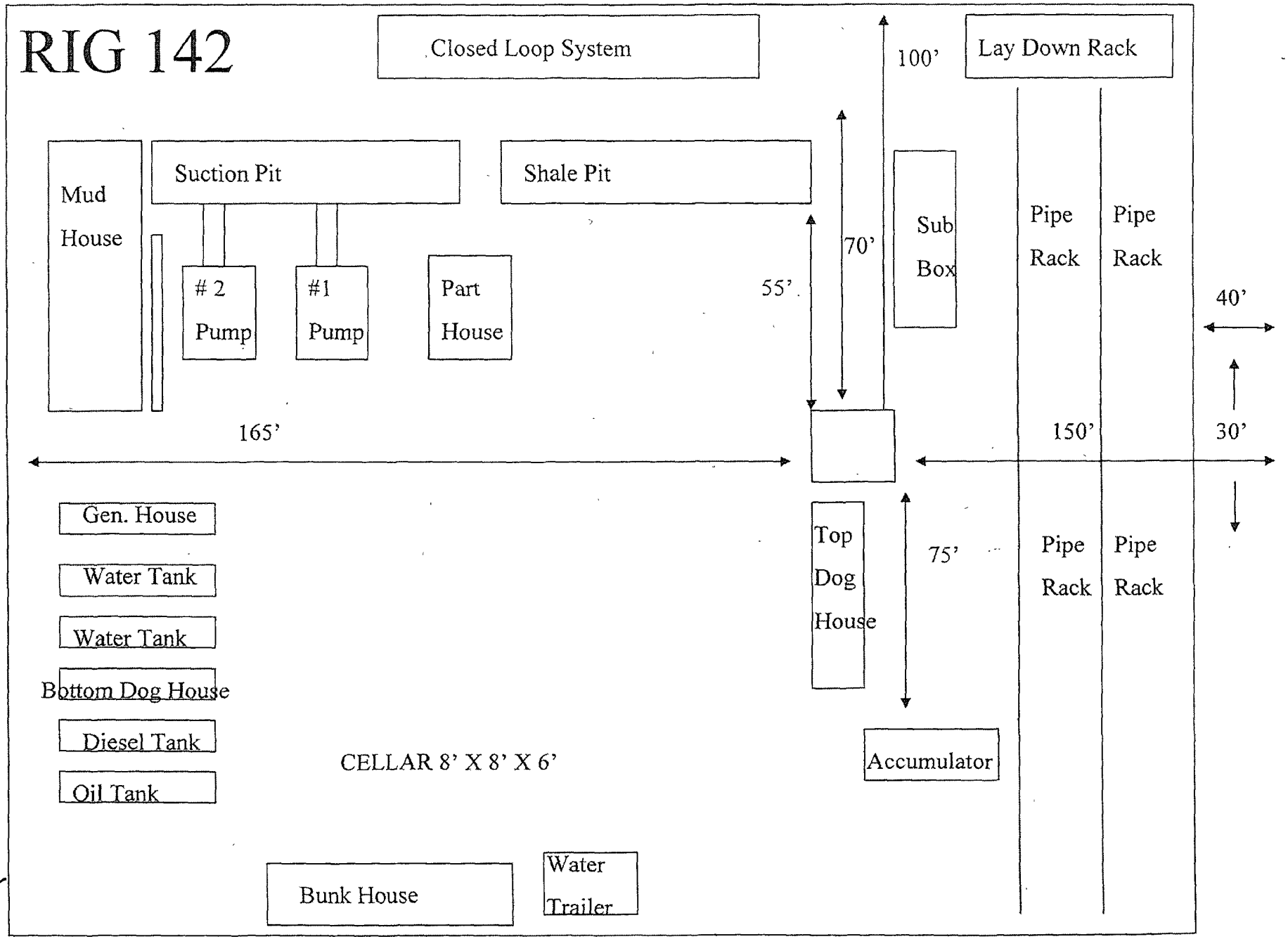

RIG 142
Closed Loop System
100'
Lay Down Rack
Mud House
Suction Pit
Shale Pit
Sub Box
Pipe Rack
Pipe Rack
2 Pump
#1 Pump
Part House
70'
55'
40'
165'
150'
30'
Gen. House
Water Tank
Water Tank
Bottom Dog House
Diesel Tank
Oil Tank
Top Dog House
75'
Pipe Rack
Pipe Rack
CELLAR 8' X 8' X 6'
Accumulator
Bunk House
Water Trailer

EXHIBIT D

BLOWOUT PREVENTOR SCHEMATIC

CHESAPEAKE OPERATING INC

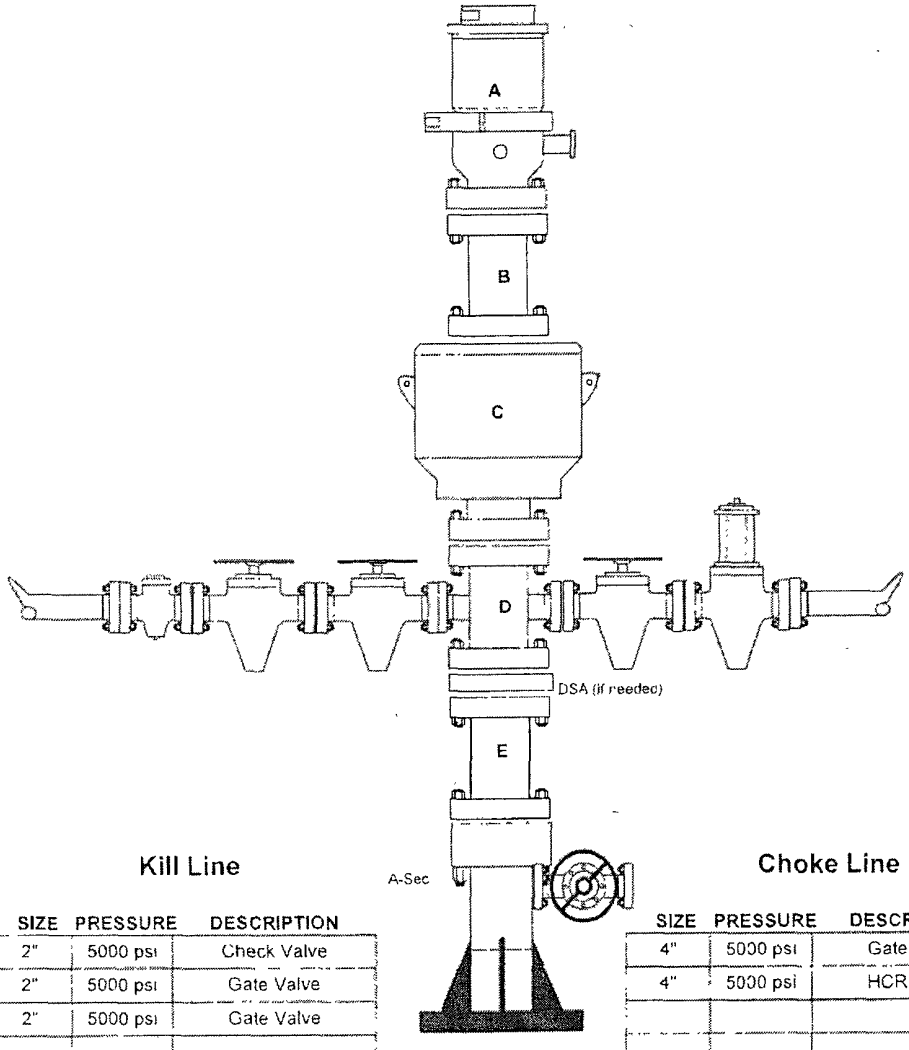
WELL : Queen Lake 20 Federal 2H

RIG : Patterson 142

COUNTY : Eddy **STATE:** New Mexico

OPERATION: Drill out below 13-3/8" Casing (12-¼" hole size)

	SIZE	PRESSURE	DESCRIPTION
A	13-5/8"	500 psi	Rot Head
B	13-5/8"	3000 psi	Spacer Spool
C	13-5/8"	3000 psi	Annular
D	13-5/8"	3000 psi	Mud Cross
E	13-5/8"	3000 psi	Spacer Spool
DSA	13-5/8" 3M x 13-5/8" 3M (if needed)		
A-Sec	13-3/8" SOW x 13-5/8" 3M		



Kill Line

SIZE	PRESSURE	DESCRIPTION
2"	5000 psi	Check Valve
2"	5000 psi	Gate Valve
2"	5000 psi	Gate Valve

Choke Line

SIZE	PRESSURE	DESCRIPTION
4"	5000 psi	Gate Valve
4"	5000 psi	HCR Valve

EXHIBIT F-1

BLOWOUT PREVENTOR SCHEMATIC

CHESAPEAKE OPERATING INC

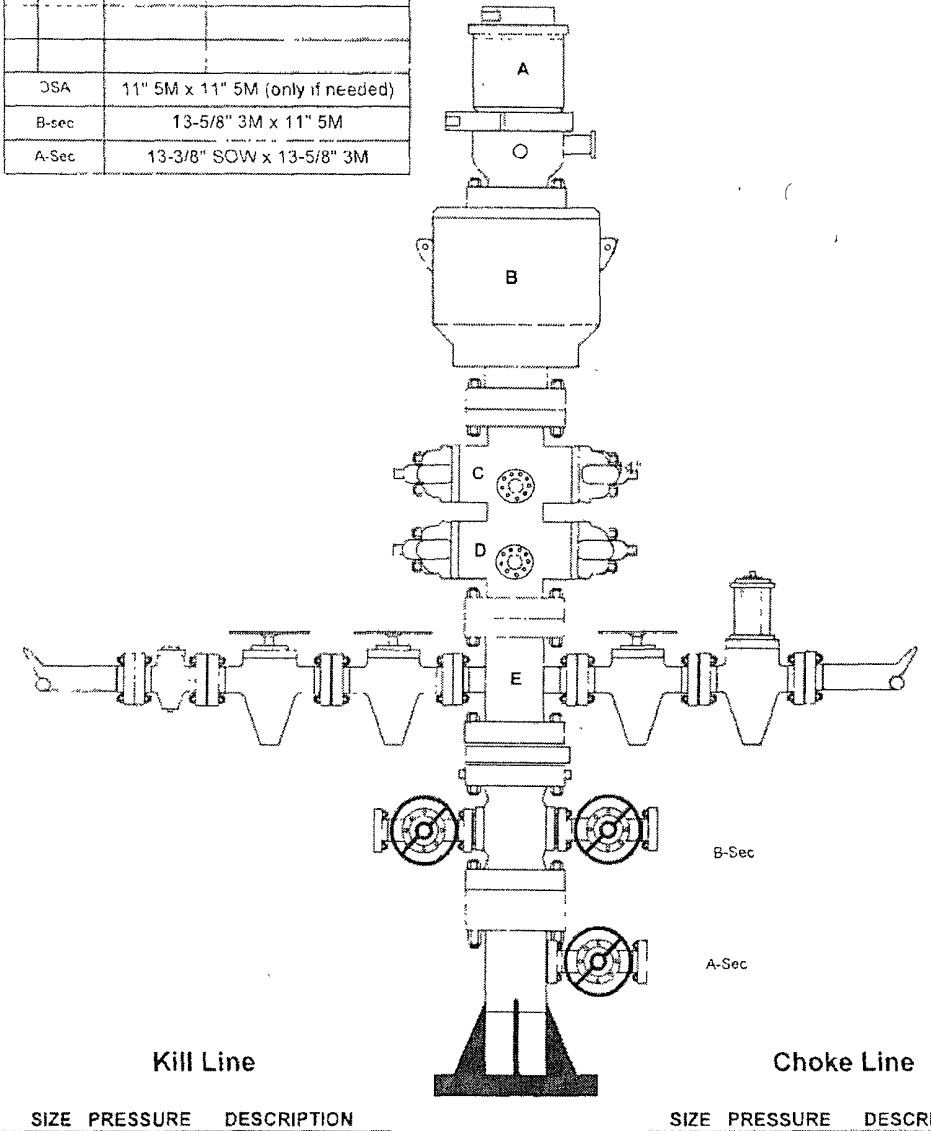
WELL : Queen Lake 20 Federal 2H

RIG : Patterson 142

COUNTY : Eddy STATE: New Mexico

OPERATION: **Drill out below 9-5/8" Casing** (8-3/4"/8-½" hole size)

	SIZE	PRESSURE	DESCRIPTION
A	11"	500 psi	Rot Head
B	11"	5000 psi	Annular
C	11"	5000 psi	Pipe Rams
D	11"	5000 psi	Blind Rams
E	11"	5000 psi	Mud Cross
DSA		11" 5M x 11" 5M (only if needed)	
B-sec		13-5/8" 3M x 11" 5M	
A-Sec		13-3/8" SOW x 13-5/8" 3M	



Kill Line

SIZE	PRESSURE	DESCRIPTION
2"	5000 psi	Check Valve
2"	5000 psi	Gate Valve
2"	5000 psi	Gate Valve

Choke Line

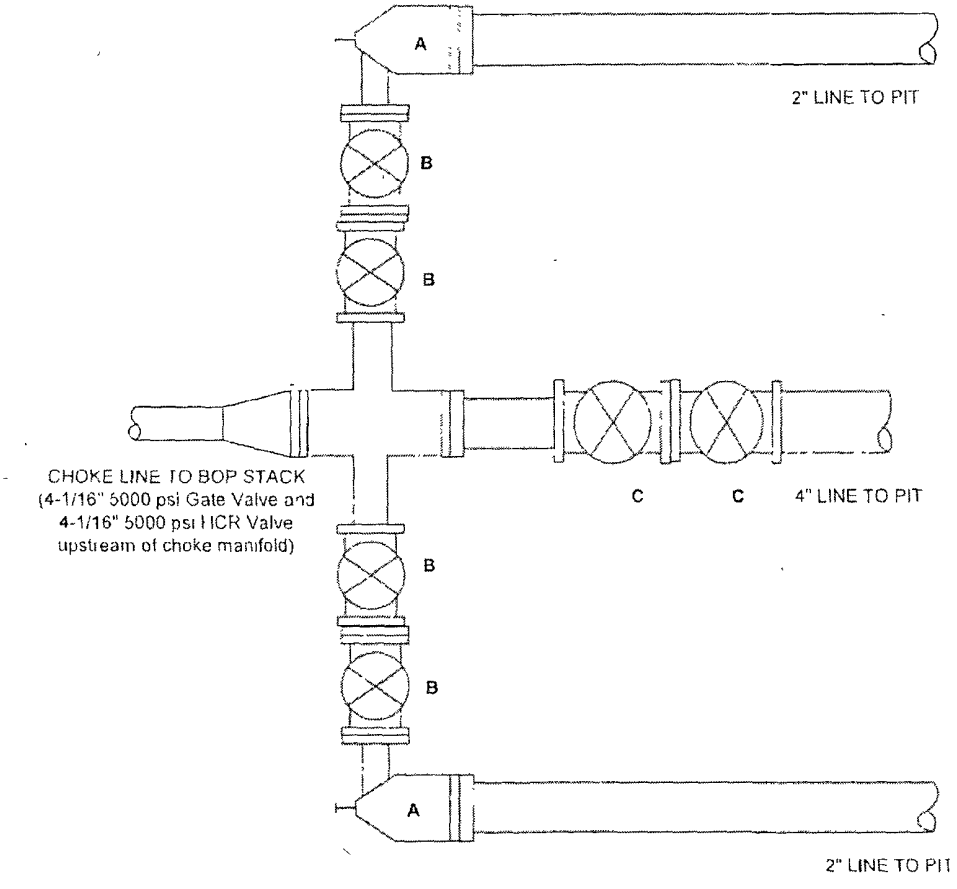
SIZE	PRESSURE	DESCRIPTION
4"	5000 psi	Gate Valve
4"	5000 psi	HCR Valve

EXHIBIT F-2

CHOKE MANIFOLD SCHEMATIC

CHESAPEAKE OPERATING, INC.

WELL : Queen Lake 20 Federal 2H
RIG : Patterson #142
COUNTY : Eddy STATE : New Mexico
OPERATION: Drilling below/beyond 13-3/8" surface casing



	SIZE	PRESSURE	DESCRIPTION
A	2-1/16"	5000 psi	Manual Choke
B	2-1/16"	5000 psi	Gate Valve
C	4-1/16"	5000 psi	Gate Valve

EXHIBIT F-3

Permian District

NM - Eddy - Morrow Project
Queen Lake 20 Federal 2H
Well #1
Wellbore #1

Plan: Plan #1

Standard Planning Report

11 January, 2008

EXHIBIT 6

Database:	Drilling Database	**Local Co-ordinate Reference:**	Well Well #1
Company:	Permian District	**TVD Reference:**	RKB @ 2968 0ft
Project:	NM - Eddy - Morrow Project	**MD Reference:**	RKB @ 2968.0ft
Site:	Queen Lake 20 Federal 2H	**North Reference:**	True
Well:	Well #1	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1		

Project NM - Eddy - Morrow Project

Map System:	US State Plane 1927 (Exact solution)	**System Datum:**	Ground Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site Queen Lake 20 Federal 2H

Site Position:		**Northing:**	ft	**Latitude:**	
From:	None	**Easting:**	ft	**Longitude:**	
Position Uncertainty:	ft	**Slot Radius:**	in	**Grid Convergence:**	0.00 °

Well Well #1

Well Position	**+N/-S**	0.0 ft	**Northing:**	0 00 ft	**Latitude:**	30° 59' 24 51165130 N
	+E/-W	0 0 ft	**Easting:**	0 00 ft	**Longitude:**	105° 55' 44 13731823 W
Position Uncertainty		ft	**Wellhead Elevation:**	ft	**Ground Level:**	2,950.0 ft

Wellbore Wellbore #1

Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	User Defined	1/11/2008	0.00	0 00	0

Design Plan #1

Audit Notes:

Version:		**Phase:**	PROTOTYPE	**Tie On Depth:**	0.0

Vertical Section:	**Depth From (TVD) (ft)**	**+N/-S (ft)**	**+E/-W (ft)**	**Direction (°)**
	0 0	0.0	0.0	90 00

Plan Sections

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0 0	0 00	0 00	0.0	0 0	0 0	0.00	0.00	0.00	0 00	
7,060.0	0 00	0 00	7,060.0	0 0	0 0	0 00	0.00	0 00	0.00	
7,798.6	88 70	90.00	7,537 0	0.0	466 3	12.01	12 01	0.00	90 00	
10,938 0	88 70	90.00	7,608.2	0 0	3,604 9	0.00	0.00	0 00	0 00	

Database:	Drilling Database	**Local Co-ordinate Reference:**	Well Well #1
Company:	Permian District	**TVD Reference:**	RKB @ 2968 0ft
Project:	NM - Eddy - Morrow Project	**MD Reference:**	RKB @ 2968.0ft
Site:	Queen Lake 20 Federal 2H	**North Reference:**	True
Well:	Well #1	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
13 3/8"									
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	0.00
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	0.00
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	0.00
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	0.00
9 5/8"									
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	0.00
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	0.00
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	0.00
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	0.00
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	0.00
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	0.00
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	0.00
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	0.00
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	0.00
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	0.00
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	0.00
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	0.00
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	0.00
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	0.00
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	0.00
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	0.00
4,600.0	0.00	0.00	4,600.0	0.0	0.0	0.0	0.00	0.00	0.00
4,700.0	0.00	0.00	4,700.0	0.0	0.0	0.0	0.00	0.00	0.00
4,800.0	0.00	0.00	4,800.0	0.0	0.0	0.0	0.00	0.00	0.00
4,900.0	0.00	0.00	4,900.0	0.0	0.0	0.0	0.00	0.00	0.00
5,000.0	0.00	0.00	5,000.0	0.0	0.0	0.0	0.00	0.00	0.00

Database:	Drilling Database	**Local Co-ordinate Reference:**	Well Well #1
Company:	Permian District	**TVD Reference:**	RKB @ 2968.0ft
Project:	NM - Eddy - Morrow Project	**MD Reference:**	RKB @ 2968.0ft
Site:	Queen Lake 20 Federal 2H	**North Reference:**	True
Well:	Well #1	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
5,100.0	0.00	0.00	5,100.0	0.0	0.0	0.0	0.00	0.00	0.00
5,200.0	0.00	0.00	5,200.0	0.0	0.0	0.0	0.00	0.00	0.00
5,300.0	0.00	0.00	5,300.0	0.0	0.0	0.0	0.00	0.00	0.00
5,400.0	0.00	0.00	5,400.0	0.0	0.0	0.0	0.00	0.00	0.00
5,500.0	0.00	0.00	5,500.0	0.0	0.0	0.0	0.00	0.00	0.00
5,600.0	0.00	0.00	5,600.0	0.0	0.0	0.0	0.00	0.00	0.00
5,700.0	0.00	0.00	5,700.0	0.0	0.0	0.0	0.00	0.00	0.00
5,800.0	0.00	0.00	5,800.0	0.0	0.0	0.0	0.00	0.00	0.00
5,900.0	0.00	0.00	5,900.0	0.0	0.0	0.0	0.00	0.00	0.00
6,000.0	0.00	0.00	6,000.0	0.0	0.0	0.0	0.00	0.00	0.00
6,100.0	0.00	0.00	6,100.0	0.0	0.0	0.0	0.00	0.00	0.00
6,200.0	0.00	0.00	6,200.0	0.0	0.0	0.0	0.00	0.00	0.00
6,300.0	0.00	0.00	6,300.0	0.0	0.0	0.0	0.00	0.00	0.00
6,400.0	0.00	0.00	6,400.0	0.0	0.0	0.0	0.00	0.00	0.00
6,500.0	0.00	0.00	6,500.0	0.0	0.0	0.0	0.00	0.00	0.00
6,600.0	0.00	0.00	6,600.0	0.0	0.0	0.0	0.00	0.00	0.00
6,700.0	0.00	0.00	6,700.0	0.0	0.0	0.0	0.00	0.00	0.00
6,800.0	0.00	0.00	6,800.0	0.0	0.0	0.0	0.00	0.00	0.00
6,900.0	0.00	0.00	6,900.0	0.0	0.0	0.0	0.00	0.00	0.00
7,000.0	0.00	0.00	7,000.0	0.0	0.0	0.0	0.00	0.00	0.00
7,060.0	0.00	0.00	7,060.0	0.0	0.0	0.0	0.00	0.00	0.00
7,100.0	4.80	90.00	7,100.0	0.0	1.7	1.7	12.01	12.01	0.00
7,200.0	16.81	90.00	7,198.0	0.0	20.4	20.4	12.01	12.01	0.00
7,300.0	28.82	90.00	7,290.0	0.0	59.1	59.1	12.01	12.01	0.00
7,400.0	40.83	90.00	7,371.9	0.0	116.1	116.1	12.01	12.01	0.00
7,500.0	52.84	90.00	7,440.2	0.0	188.9	188.9	12.01	12.01	0.00
7,600.0	64.85	90.00	7,491.9	0.0	274.3	274.3	12.01	12.01	0.00
7,700.0	76.86	90.00	7,524.6	0.0	368.6	368.6	12.01	12.01	0.00
7,798.6	88.70	90.00	7,537.0	0.0	466.3	466.3	12.01	12.01	0.00
7,800.0	88.70	90.00	7,537.0	0.0	467.7	467.7	0.00	0.00	0.00
7,900.0	88.70	90.00	7,539.3	0.0	567.6	567.6	0.00	0.00	0.00
8,000.0	88.70	90.00	7,541.6	0.0	667.6	667.6	0.00	0.00	0.00
8,100.0	88.70	90.00	7,543.8	0.0	767.6	767.6	0.00	0.00	0.00
8,200.0	88.70	90.00	7,546.1	0.0	867.6	867.6	0.00	0.00	0.00
8,300.0	88.70	90.00	7,548.4	0.0	967.5	967.5	0.00	0.00	0.00
8,400.0	88.70	90.00	7,550.6	0.0	1,067.5	1,067.5	0.00	0.00	0.00
8,500.0	88.70	90.00	7,552.9	0.0	1,167.5	1,167.5	0.00	0.00	0.00
8,600.0	88.70	90.00	7,555.2	0.0	1,267.5	1,267.5	0.00	0.00	0.00
8,700.0	88.70	90.00	7,557.4	0.0	1,367.4	1,367.4	0.00	0.00	0.00
8,800.0	88.70	90.00	7,559.7	0.0	1,467.4	1,467.4	0.00	0.00	0.00
8,900.0	88.70	90.00	7,562.0	0.0	1,567.4	1,567.4	0.00	0.00	0.00
9,000.0	88.70	90.00	7,564.3	0.0	1,667.4	1,667.4	0.00	0.00	0.00
9,100.0	88.70	90.00	7,566.5	0.0	1,767.3	1,767.3	0.00	0.00	0.00
9,200.0	88.70	90.00	7,568.8	0.0	1,867.3	1,867.3	0.00	0.00	0.00
9,300.0	88.70	90.00	7,571.1	0.0	1,967.3	1,967.3	0.00	0.00	0.00
9,400.0	88.70	90.00	7,573.3	0.0	2,067.2	2,067.2	0.00	0.00	0.00
9,500.0	88.70	90.00	7,575.6	0.0	2,167.2	2,167.2	0.00	0.00	0.00
9,600.0	88.70	90.00	7,577.9	0.0	2,267.2	2,267.2	0.00	0.00	0.00
9,700.0	88.70	90.00	7,580.1	0.0	2,367.2	2,367.2	0.00	0.00	0.00
9,800.0	88.70	90.00	7,582.4	0.0	2,467.1	2,467.1	0.00	0.00	0.00
9,900.0	88.70	90.00	7,584.7	0.0	2,567.1	2,567.1	0.00	0.00	0.00
10,000.0	88.70	90.00	7,586.9	0.0	2,667.1	2,667.1	0.00	0.00	0.00
10,100.0	88.70	90.00	7,589.2	0.0	2,767.1	2,767.1	0.00	0.00	0.00
10,200.0	88.70	90.00	7,591.5	0.0	2,867.0	2,867.0	0.00	0.00	0.00

Database:	Drilling Database	**Local Co-ordinate Reference:**	Well Well #1
Company:	Permian District	**TVD Reference:**	RKB @ 2968.0ft
Project:	NM - Eddy - Morrow Project	**MD Reference:**	RKB @ 2968 0ft
Site:	Queen Lake 20 Federal 2H	**North Reference:**	True
Well:	Well #1	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
10,300 0	88 70	90.00	7,593.7	0 0	2,967.0	2,967 0	0 00	0.00	0 00
10,400 0	88.70	90 00	7,596.0	0.0	3,067.0	3,067 0	0.00	0 00	0.00
10 500 0	88.70	90.00	7,598.3	0.0	3,167.0	3,167 0	0 00	0 00	0.00
10,600 0	88 70	90 00	7,600 6	0.0	3,266 9	3,266 9	0 00	0.00	0 00
10 700 0	88 70	90 00	7,602 8	0 0	3,366 9	3,366 9	0 00	0 00	0 00
10,800 0	88 70	90.00	7,605.1	0.0	3,466.9	3,466 9	0 00	0.00	0.00
10,900.0	88.70	90 00	7,607.4	0.0	3,566.9	3,566.9	0 00	0.00	0 00
10,938 0	88 70	90 00	7,608.2	0.0	3,604.9	3,604 9	0.00	0 00	0 00
5 1/2"									

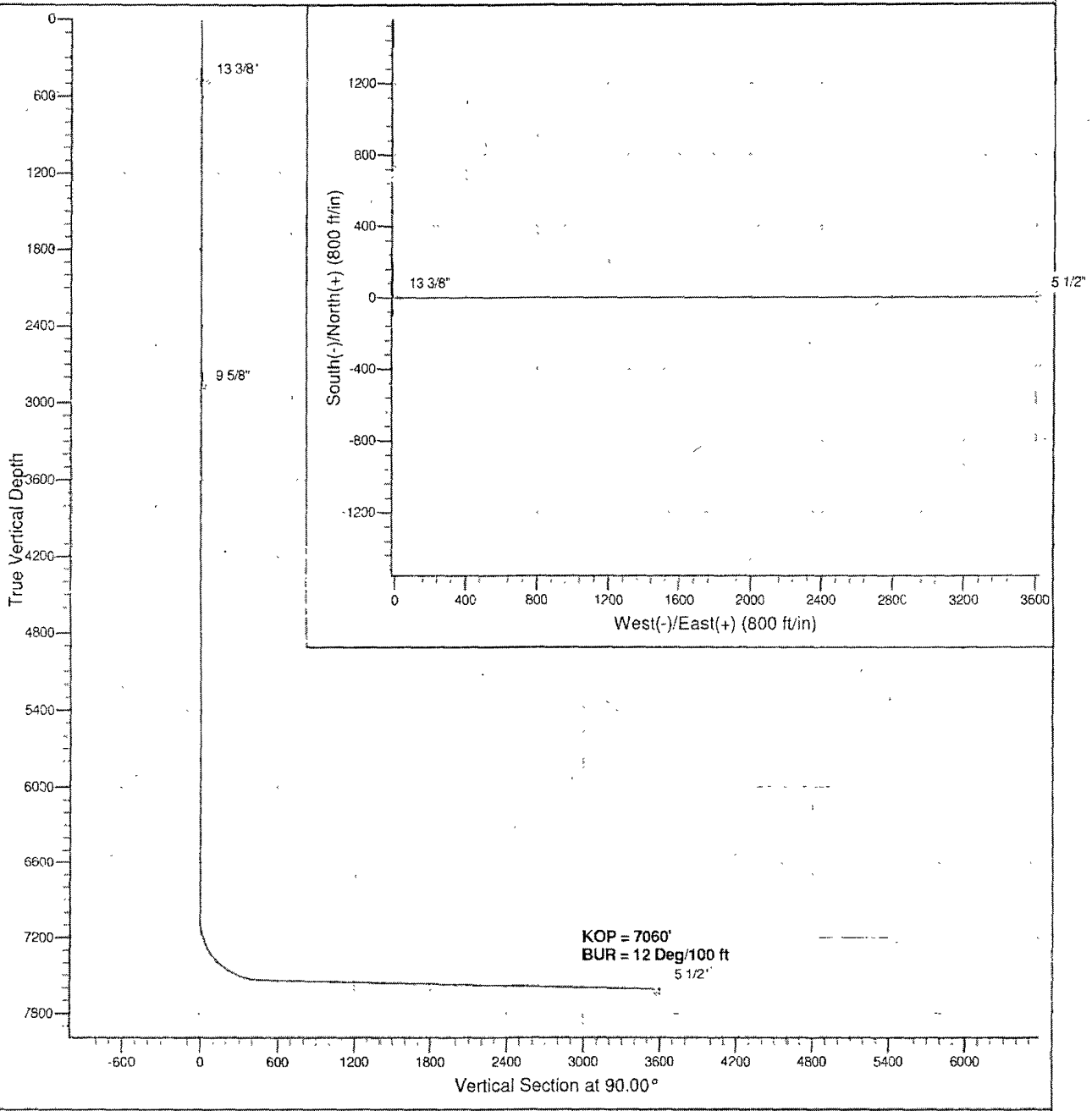
Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
500 0	500 0	13 3/8"	13 3/5	17.500
2 900 0	2,900.0	9 5/8"	9.625	12 250
10,938 0	7,608 2	5 1/2"	5 500	8 500

Chesapeake Operating Inc. Queen Lake 20 Federal 2H

County: Eddy, NM

Section 20-24S-29E



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0 0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	7060.0	0.00	0.00	7060.0	0.0	0.0	0.00	0.00	0.0	
3	7798.6	88.70	90.00	7537.0	0.0	466.3	12.01	90.00	466.3	
4	10938.0	88 70	90.00	7608.2	0.0	3604.9	0.00	0.00	3604.9	

ONSHORE OIL & GAS ORDER NO. 1
Approval of Operations on Onshore
Federal and Indian Oil and Gas Leases

1. EXISTING ROADS

a. Existing county and lease roads will be used to enter proposed access road.
b. Location, access, and vicinity plats attached hereto. See Exhibits A-1 to A-4.

2. PLANNED LOCATION

a. In order to level the location, cut and fill will be required. Please see attached Well Location and Acreage Dedication Plat – Exhibits A-1 to A-4.
b. A locking gate will be installed at the site entrance.
c. Any fences cut will be repaired. Cattle guards will be installed, if needed.
d. Surface disturbance and vehicular travel will be limited to the approved location and approved access route. Any additional area needed will be approved in advance.
e. Driving directions are from intersection of Co. Rd. #746 (McDonald Rd) and Co. Rd. #788A (Spur Rd), go Southeast on Co. Rd #746 approx. 0.5 miles. This location is approx. 150 feet South.

3. LOCATION OF EXISTING WELLS WITHIN A 1-MILE RADIUS OF THE PROPOSED LOCATION – see Exhibit B.

4. LOCATION OF PRODUCTION FACILITIES
It is anticipated that production facilities will be located on the well pad as product will be sold at the Queen Lake 19 Fed 1 tank battery. We proposed to run 1584' of 2 7/8" Steel Tubing w/poly Liner to the tank battery. – See Exhibit C

5. LOCATION AND TYPE OF WATER SUPPLY
Water will be obtained from a private water source. Chesapeake Operating, Inc. will ensure all proper notifications and filings are made with the state.

6. CONSTRUCTION MATERIALS
No construction materials will be used from Section 20-24S-29E. All material (i.e. shale) will be acquired from private or commercial sources.

7. METHODS FOR HANDLING WASTE DISPOSAL
A closed system will be utilized consisting of above ground steel tanks. All wastes accumulated during drilling operations will be contained in a portable trash cage and removed from location and deposited in an approved sanitary landfill.

8. ANCILLARY FACILITIES
None

9. WELLSITE LAYOUT
The proposed site layout plat is attached showing Patterson #142 rig orientation and equipment location. See Exhibit D. Also see Exhibit A-2 for the size of the pad.

10. PLANS FOR RECLAMATION OF THE SURFACE
The location will be restored to as near as original condition as possible. Reclamation of the surface shall be done in strict compliance with the existing New Mexico Oil Conservation Division regulations.

Backfilling leveling, and contouring are planned as soon as the drilling rig and steel tanks are removed. Wastes and spoils materials will be buried immediately after drilling is completed. If production is obtained, the unused area will be restored as soon as possible. The rehabilitation will begin after the drilling rig is removed.

11. SURFACE & MINERAL OWNERSHIP
United States of America
Department of Interior
Bureau of Land Management

GRAZING LESSEE
Jerry Ballard 575-361-0545
P. O. Box 60
Malaga, NM 88263
(Chesapeake Operating, Inc. has an agreement with the grazing lessee)

12. ADDITIONAL INFORMATION

A Class III cultural resource inventory report was prepared by Boone Archaeological Services, Carlsbad, New Mexico for the proposed location. A copy of the report has been sent to the BLM office under separate cover and is also attached for reference. See Exhibit E.

Chesapeake Operating, Inc. agrees to be responsible under the terms and conditions of the lease for the operations conducted upon the lease lands.

13. OPERATOR'S REPRESENTATIVES

Drilling and Completion Operations
Randy Herring
Sr. Asset Manager – Permian North
P.O. Box 18496
Oklahoma City, OK 73154
(405) 767-4399 (OFFICE)
(405) 879-7930 (FAX)
randy.herring@chk.com

Sr. Drilling Engineer
Todd Nance
P.O. Box 14896
Oklahoma City, OK 73154
(405) 879-9301 (OFFICE)
(405) 810-2795 (FAX)
(405) 919-9148 (MOBILE)
todd.nance@chk.com

Field Representative
Curtis Griffin
1616 W. Bender
Hobbs, NM
505-391-1462 (OFFICE)
505-391-6679 (FAX)
curtis.griffin@chk.com

Assett Manager
Jeff Finnell
P.O. Box 18496
Oklahoma City, OK 73154-0496
405-767-4347 (OFFICE)
405-879-7930 (FAX)
jeff.finnell@chk.com

Regulatory Compliance
Linda Good
Regulatory Compliance Specialist
P.O. Box 18496
Oklahoma City, OK 73154
(405) 767-4275 (OFFICE)
(405) 879-7908 (FAX)
linda.good@chk.com

CERTIFICATION

I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently exist; that I have full knowledge of state and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and, that the work associated with the operations proposed will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of a false statement.

Executed this 14 day of February, 2008.

Name: Paul Hagemeier, Vice President – Regulatory Compliance

Address: P.O. Box 18496, Oklahoma City, OK 73154-0496

Telephone: 405-848-8000

Field Representative: Curtis Griffin

Telephone: 505-391-1462 Ext 6238

E-mail: curtis.griffin@chk.com

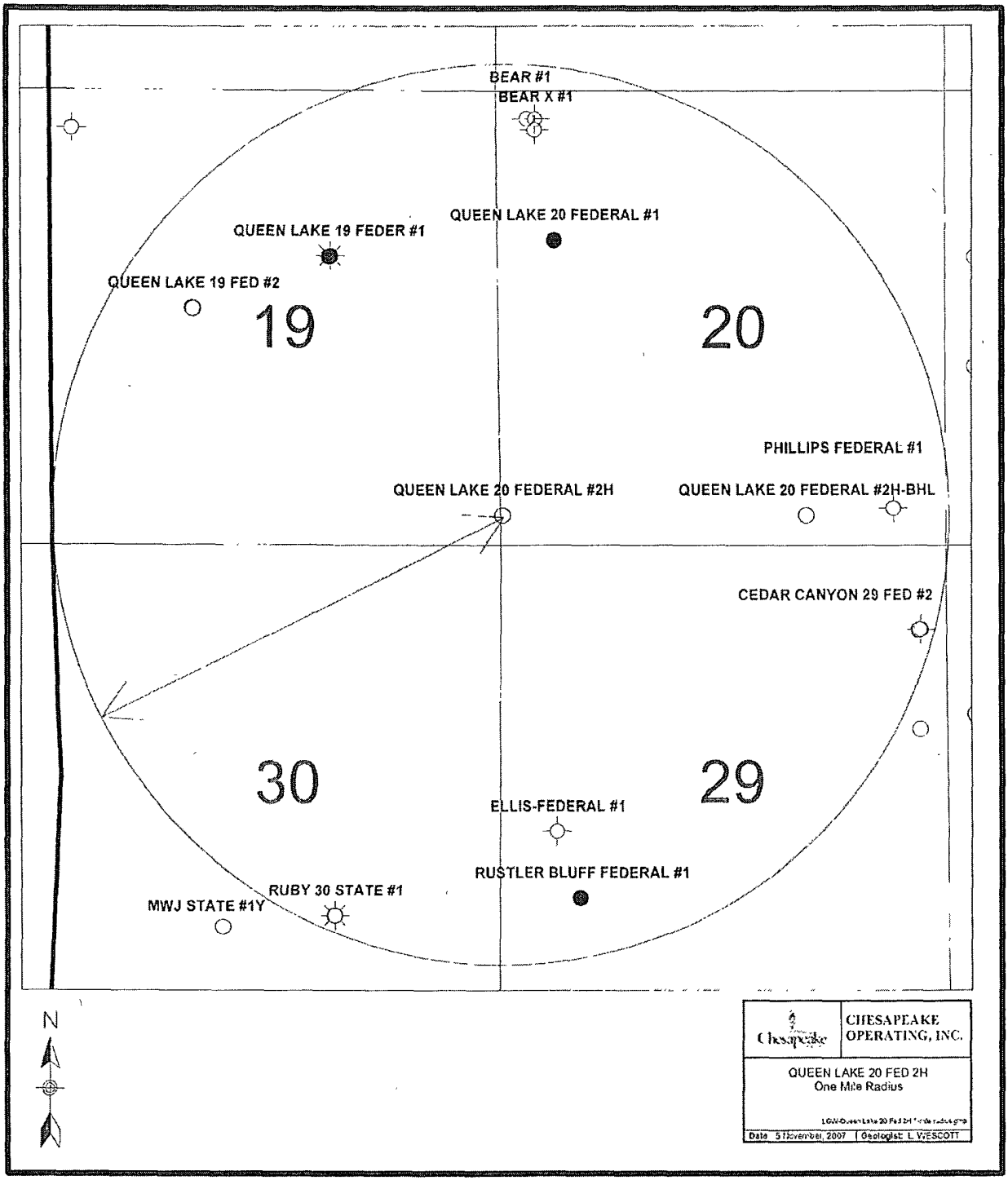

BEAR #1
BEAR X #1
QUEEN LAKE 19 FEDER #1
QUEEN LAKE 20 FEDERAL #1
QUEEN LAKE 19 FED #2
19
20
PHILLIPS FEDERAL #1
QUEEN LAKE 20 FEDERAL #2H
QUEEN LAKE 20 FEDERAL #2H-BHL
CEDAR CANYON 29 FED #2
30
29
ELLIS-FEDERAL #1
RUSTLER BLUFF FEDERAL #1
RUBY 30 STATE #1
MWJ STATE #1Y
N
CHESAPEAKE OPERATING, INC.
QUEEN LAKE 20 FED 2H
One Mile Radius
Date 5 November, 2007
Geologist: L WESCOTT

EXHIBIT B

PECOS DISTRICT
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Chesapeake Operating
LEASE NO.:	NMNM17224
WELL NAME & NO.:	Queen Lake 20 Federal No 2H
SURFACE HOLE FOOTAGE:	350' FSL & 1650' FEL
BOTTOM HOLE FOOTAGE	350' FSL & 350' FWL
LOCATION:	Section 20, T. 24 S., R 29 E., NMPM
COUNTY:	Eddy County, New Mexico

TABLE OF CONTENTS

Standard Conditions of Approval (COA) apply to this APD. If any deviations to these standards exist or special COAs are required, the section with the deviation or requirement will be checked below.

I. GENERAL PROVISIONS

The approval of the Application For Permit To Drill (APD) is in compliance with all applicable laws and regulations: 43 Code of Federal Regulations 3160, the lease terms, Onshore Oil and Gas Orders, Notices To Lessees, New Mexico Oil Conservation Division (NMOCD) Rules, National Historical Preservation Act As Amended, and instructions and orders of the Authorized Officer. Any request for a variance shall be submitted to the Authorized Officer on Form 3160-5, Sundry Notices and Report on Wells.

II. PERMIT EXPIRATION

If the permit terminates prior to drilling and drilling cannot be commenced within 60 days after expiration, an operator is required to submit Form 3160-5, Sundry Notices and Reports on Wells, requesting surface reclamation requirements for any surface disturbance. However, if the operator will be able to initiate drilling within 60 days after the expiration of the permit, the operator must have set the conductor pipe in order to allow for an extension of 60 days beyond the expiration date of the APD. (Filing of a Sundry Notice is required for this 60 day extension.)

III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

Any cultural and/or paleontological resource discovered by the operator or by any person working on the operator's behalf shall immediately report such findings to the Authorized Officer. The operator is fully accountable for the actions of their contractors and subcontractors. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery shall be made by the Authorized Officer to determine the appropriate actions that shall be required to prevent the loss of significant cultural or scientific values of the discovery. The operator shall be held responsible for the cost of the proper mitigation measures that the Authorized Officer assesses after consultation with the operator on the evaluation and decisions of the discovery. Any unauthorized collection or disturbance of cultural or paleontological resources may result in a shutdown order by the Authorized Officer.

IV. NOXIOUS WEEDS

The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, pads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

V. SPECIAL REQUIREMENT(S)

Mitigation Measures: The mitigation measures include the Pecos District Conditions of Approval, and the standard stipulations for high cave/karst occurrence. Cave/Karst – The location has been designated as high karst occurrence. Conditions of approval will include berming of tanks for retention of leaks to prevent possible contamination of karst aquifers and contamination of nearby water wells.

Queen Lake 20 Federal # 2H: Closed Loop northeast V-Door southeast

Conditions of Approval
Cave and Karst

** Depending on location, additional Drilling, Casing, and Cementing procedures may be required to protect critical karst groundwater recharge areas.

Cave/Karst Surface Mitigation

The following stipulations will be applied to minimize impacts during construction, drilling and production.

Berming:
Tank batteries will be bermed to contain 1 ½ times the content of the largest tank.

Bermed areas will be lined with a 4 oz. felt liner to prevent tears or punctures and a permanent 20 mil plastic liner.

Leak Detection System:
A method of detecting leaks is required. The method could incorporate gauges to measure loss, situating values and lines so they can be visually inspected, or installing electronic sensors to alarm when a leak is present. Leak detection plan will be submitted to BLM for approval.

Automatic Shut-off Systems:
Automatic shut off, check values, or similar systems will be installed for pipelines and tanks to minimize the effects of catastrophic line failures used in production or drilling.

Closed Mud System Using Steel Tanks with All Fluids and Cuttings Hauled Off.
A closed mud system using steel tanks for all cuttings and fluids is required. All fluids and cuttings will be hauled off site for disposal. No pits are allowed.

Cave/Karst Subsurface Mitigation

The following stipulations will be applied to protect cave/karst and ground water concerns:

Lost Circulation:
ALL lost circulation zones from the surface to the base of the cave occurrence zone will be logged and reported in the drilling report.

Regardless of the type of drilling machinery used, if a void of four feet or more and circulation losses greater than 70 percent occur simultaneously while drilling in any cave-bearing zone, the BLM will be notified immediately by the operator. The BLM will assess the situation and work with the operator on corrective actions to resolve the problem.

Delayed Blasting:
Any blasting will be phased and time delayed.

Abandonment Cementing:
Upon well abandonment the well bore will be cemented completely from 100 feet below the bottom of the cave bearing zone to the surface.

Pressure Testing:
Annual pressure monitoring will be performed by the operator on all casing annuli and reported in a sundry notice. If the test results indicated a casing failure has occurred, remedial action will be undertaken to correct the problem to the BLM's approval.

VI. CONSTRUCTION

A. NOTIFICATION

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the Carlsbad Field Office at (505) 234-5972 at least 3 working days prior to commencing construction of the access road and/or well pad.

When construction operations are being conducted on this well, the operator shall have the approved APD and Conditions of Approval (COA) on the well site and they shall be made available upon request by the Authorized Officer.

B. TOPSOIL

The operator shall stockpile the topsoil of the well pad. The topsoil shall not be used to backfill the reserve pit and will be used for interim and final reclamation.

C. Closed Loop System

Queen Lake 20 Federal # 2H: Closed Loop northeast V-Door southeast

Tanks are required for drilling operations: No Pits.

The operator shall properly dispose of drilling contents at an authorized disposal site.

D. FEDERAL MINERAL MATERIALS PIT

If the operator elects to surface the access road and/or well pad, mineral materials extracted during construction of the reserve pit may be used for surfacing the well pad and access road and other facilities on the lease.

Payment shall be made to the BLM prior to removal of any additional federal mineral materials from any site other than the reserve pit. Call the
Carlsbad Field Office at (505) 234-5972.

E. WELL PAD SURFACING

Surfacing of the well pad is not required.

If the operator elects to surface the well pad, the surfacing material may be required to be removed at the time of reclamation.

The well pad shall be constructed in a manner which creates the smallest possible surface disturbance, consistent with safety and operational needs.

F. ON LEASE ACCESS ROADS

Road Width
The access road shall have a driving surface that creates the smallest possible surface disturbance and does not exceed fourteen (14) feet in width. The maximum width of surface disturbance, when constructing the access road, shall not exceed thirty (30) feet.

Surfacing
Surfacing material is not required on the new access road driving surface. If the operator elects to surface the new access road or pad, the surfacing material may be required to be removed at the time of reclamation.

Where possible, no improvements should be made on the unsurfaced access road other than to remove vegetation as necessary, road irregularities, safety issues, or to fill low areas that may sustain standing water.

The Authorized Officer reserves the right to require surfacing of any portion of the access road at any time deemed necessary. Surfacing may be required in the event the road deteriorates, erodes, road traffic increases, or it is determined to be beneficial for future field development. The surfacing depth and type of material will be determined at the time of notification.

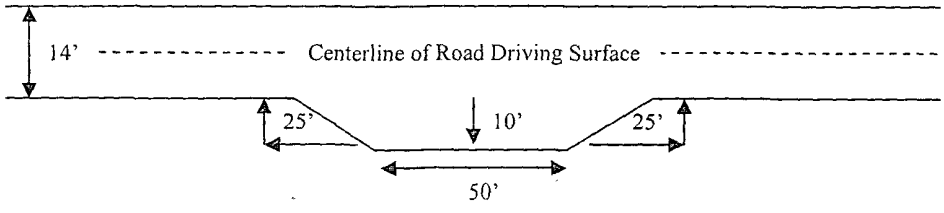
Crowning
Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

Ditching

Ditching shall be required on both sides of the road.

Turnouts
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall be constructed on all blind curves. Turnouts shall conform to the following diagram:

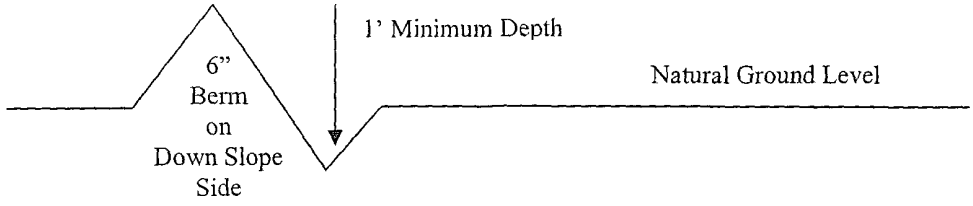
Standard Turnout – Plan View



Drainage
Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outsloping and insloping, lead-off ditches, culvert installation, and low water crossings).

A typical lead-off ditch has a minimum depth of 1 foot below and a berm of 6 inches above natural ground level. The berm shall be on the down-slope side of the lead-off ditch.

Cross Section of a Typical Lead-off Ditch



All lead-off ditches shall be graded to drain water with a 1 percent minimum to 3 percent maximum ditch slope. The spacing interval are variable for lead-off ditches and shall be determined according to the formula for spacing intervals of lead-off ditches, but may be amended depending upon existing soil types and centerline road slope (in %);

Formula for Spacing Interval of Lead-off Ditches

Example - On a 4% road slope that is 400 feet long, the water flow shall drain water into a lead-off ditch. Spacing interval shall be determined by the following formula:

$$\text{400 foot road with 4\% road slope: } \frac{400'}{4\%} + 100' = 200' \text{ lead-off ditch interval}$$

Culvert Installations
Appropriately sized culvert(s) shall be installed at the deep waterway channel flow crossing.

Cattleguards
An appropriately sized cattleguard(s) sufficient to carry out the project shall be installed and maintained at fence crossing(s).

Any existing cattleguard(s) on the access road shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for the condition of the existing cattleguard(s) that are in place and are utilized during lease operations.

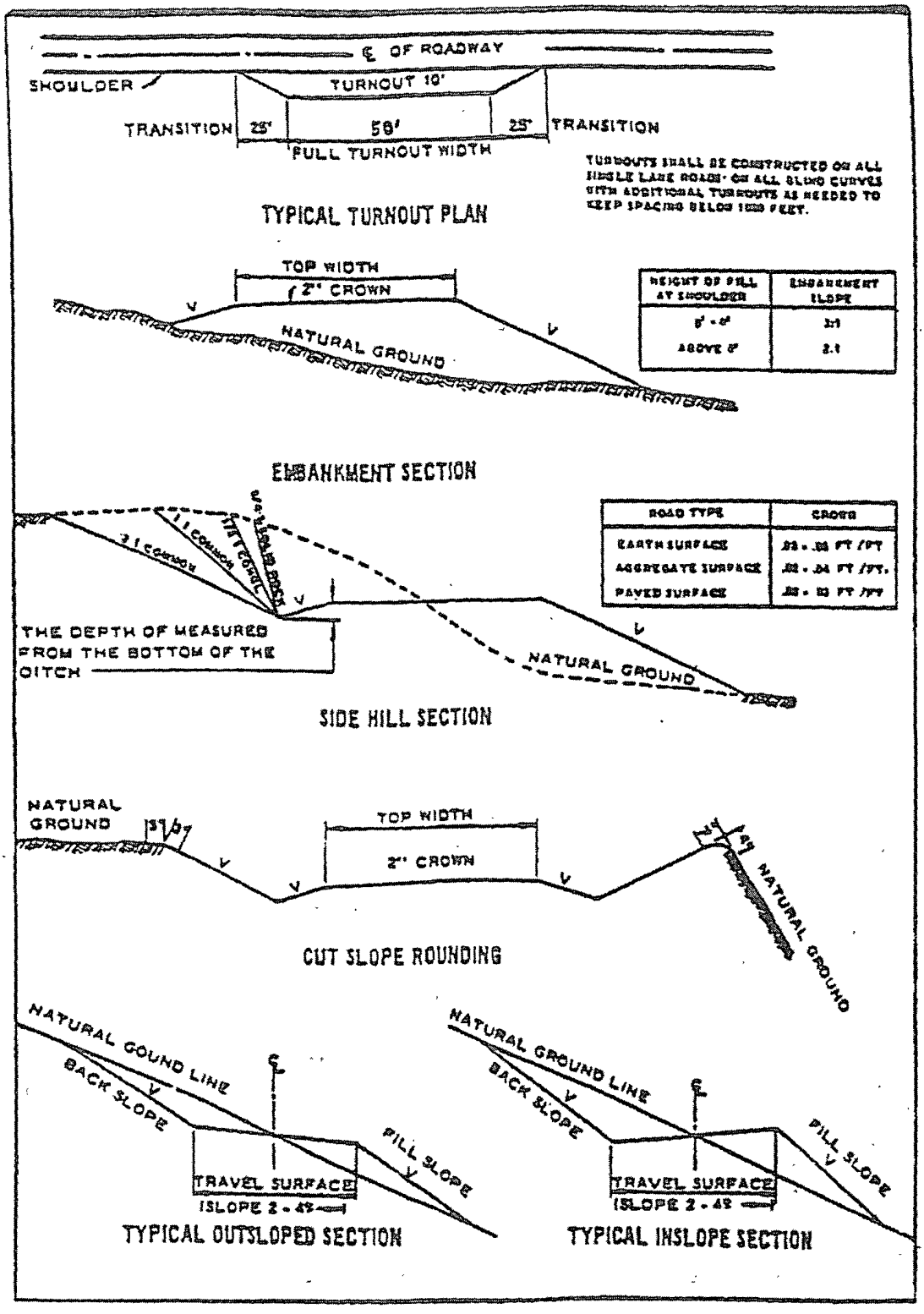
A gate shall be constructed and fastened securely to H-braces.

Fence Requirement
Where entry is required across a fence line, the fence shall be braced and tied off on both sides of the passageway prior to cutting.

The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fence(s).

Public Access
Public access on this road shall not be restricted by the operator without specific written approval granted by the Authorized Officer.

Figure 1 – Cross Sections and Plans For Typical Road Sections



VII. DRILLING

A. DRILLING OPERATIONS REQUIREMENTS

The BLM is to be notified a minimum of 4 hours in advance for a representative to witness:

a. Spudding well
b. Setting and/or Cementing of all casing strings
c. BOPE tests

☒ **Eddy County**
Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220, (575) 361-2822

1. **Although Hydrogen Sulfide has not been reported in the area, it is always a potential hazard. If Hydrogen Sulfide is encountered, please report measured amounts and formations to the BLM.**

2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.

3. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.

B. CASING

1. The **13-3/8** inch surface casing shall be set **at approximately 650 feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt)** and cemented to the surface.

   a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with a surface log readout will be used or a cement bond log shall be run to verify the top of the cement.

   b. Wait on cement (WOC) time for a primary cement job will be a minimum 18 hours for a water basin, 24 hours in the potash area, or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement). **Please provide WOC times to inspector for cement slurries.**

c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.

d. If cement falls back, remedial cementing will be done prior to drilling out that string.

High cave/karst.
Possible lost circulation in the Delaware Mountain Group and Bone Spring formation.

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:

   ☒ Cement to surface. If cement does not circulate see B.1.a-d above. **Please provide WOC times to inspector for cement slurries.**

If 75% or greater lost circulation occurs while drilling the intermediate casing hole, the cement on the production casing must come to surface.

3. The minimum required fill of cement behind the **5-1/2** inch production casing is:

   ☒ Cement should tie-back at least 500 feet into previous casing string. Operator shall provide method of verification. **Additional cement may be required.**

4. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

C. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.

2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **2000 (2M)** psi. **A 3M annular will be installed and tested as a 2M. Schematic does not qualify as a 3M.**

3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **9-5/8"** intermediate casing shoe shall be **3000 (3M)** psi. **A 5M BOP will be installed with a 3M manifold and tested to 3M.**

4. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.

   a. The tests shall be done by an independent service company.

   b. The results of the test shall be reported to the appropriate BLM office.

   c. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.

   d. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug.

D. DRILL STEM TEST

If drill stem tests are performed, Onshore Order 2.III.D shall be followed.

WWI 031308

VIII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

Placement of Production Facilities
Production facilities should be placed on the well pad to allow for maximum interim recontouring and revegetation of the well location.

Containment Structures
The containment structure shall be constructed to hold the capacity of the entire contents of the largest tank, plus 24 hour production, unless more stringent protective requirements are deemed necessary by the Authorized Officer.

Painting Requirement
All above-ground structures including meter housing that are not subject to safety requirements shall be painted a flat non-reflective paint color
Shale Green, Munsell Soil Color Chart # 5Y 4/2

IX. INTERIM RECLAMATION & RESERVE PIT CLOSURE

A. INTERIM RECLAMATION

If the well is a producer, interim reclamation shall be conducted on the well site in accordance with the orders of the Authorized Officer. The operator shall submit a Sundry Notices and Reports on Wells (Notice of Intent), Form 3160-5, prior to conducting interim reclamation.

During the life of the development, all disturbed areas not needed for active support of production operations should undergo interim reclamation in order to minimize the environmental impacts of development on other resources and uses.

At the time the well pad is to be reclaimed, operators should work with BLM surface management specialists to devise the best strategies to reduce the size of the location. Any reductions should allow for remedial well operations, as well as safe and efficient removal of oil and gas.

During reclamation, the removal of caliche is important to increasing the success of revegetating the site. Removed caliché may be used for road repairs, fire walls or for building other roads and locations. In order to operate the well or complete workover operations, it may be necessary to drive, park and operate on restored interim vegetation within the previously disturbed area. Disturbing revegetated areas for production or workover operations will be allowed. If there is significant disturbance and loss of vegetation, the area will need to be revegetated. Communicate with the appropriate BLM office for any exceptions/exemptions if needed.

Seed Mixture 1, for Loamy Sites

The holder shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)* per acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed will be tested and the viability testing of seed will be done in accordance with State law(s) and within nine (9) months prior to purchase. Commercial seed will be either certified or registered seed. The seed container will be tagged in accordance with State law(s) and available for inspection bye the authorized officer.

Seed will be planted using a drill equipped with a depth regulator to ensure proper depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture will be evenly and uniformly planted over the disturbed area (small/heavier seeds have a tendency to drop the bottom of the drill and are planted first). The holder shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed will be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre are to be doubled. The seeding will be repeated until a satisfactory stand is established as determined by the authorized officer. Evaluation of growth will not be made before completion of at least one full growing season after seeding.

Species to be planted in pounds of pure live seed* per acre:

Species	lb/acre
Plains lovegrass (Eragrostis intermedia)	0.5
Sand dropseed (Sporobolus cryptandrus)	1.0
Sideoats grama (Bouteloua curtipendula)	5.0

*Pounds of pure live seed:

Pounds of seed **x** percent purity **x** percent gemination = pounds pure live seed

(Insert Seed Mixture Here)

X. FINAL ABANDONMENT & REHABILITATION REQUIREMENTS

Upon abandonment of the well and/or when the access road is no longer in service the Authorized Officer shall issue instructions and/or orders for surface reclamation and restoration of all disturbed areas.

On private surface/federal mineral estate land the reclamation procedures on the road and well pad shall be accomplished in accordance with the private surface land owner agreement.